National Differences in Teamwork

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ABSTRACT

National groups vary in how they engage in organizational collaboration and teamwork. These variations are important to consider when undertaking coalition operations, predicting adversary actions, and facilitating/impeding technology transfer as well as developing organizational simulations. Many descriptions of effective teamwork, such as the "Big Five" model (Sims, Salas, & Burke, 2003), emphasize competencies such as Mutual Performance Monitoring, Back-up Behavior, Adaptability/Flexibility, Team Orientation, and leadership that promote effective interaction. They look at mechanisms such as Shared Mental Models, Closed-Loop Communication, and Mutual Trust. These team competencies and mechanisms are compatible with Western organizations. They are not consistent with the cognition and interactive patterns that characterize collaboration and organizational functioning in other regions of the world. Therefore, if we want to describe and model multinational organizations and

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collaboration, we must move beyond our Western research base and incorporate the dynamics of collaboration found in non-Western nations.

INTRODUCTION

The purpose of this chapter is to explain why we cannot generalize from Western models of teamwork and coordination to account for the nature of collaboration in non-Western nations. By Western, we refer mostly to those from English-speaking and Western European nations. Our thesis is simple: the nature of collaboration is strikingly different when we cross national boundaries. Therefore, our preconceptions, our theories, our best practices, all have the potential to mislead us. This is true whether we are designing simulations or establishing doctrine or preparing negotiations or trying to improve cooperation.

Because we live in a time of globalization, national differences in the nature of collaboration are important in a wide range of organizations and domains. Where businesses serving American interests used to be based primarily in one state or even city, many, such as DaimlerChrysler, now span continents. Big Macs are flipped and served around the world with the backing of vast multinational management, sales, and distribution organizations. Civil aviation must manage an increasingly multinational work force. An air traffic controller at an international hub is typically supporting pilots from multiple nations. The flight crews may include several nations as expatriates help staff the airlines of many developing nations. Where scientists used to look to

colleagues down the hall, they now network with others around the world. The Internet has provided a vital tool for international communication. A variety of services are being developed to provide virtual meetings for organizations working in different countries and different hemispheres.

National differences in collaboration are also important for the military. Military organizations have always been interested in anticipating the actions and reactions of adversaries. In attempting to model the nature of these decisions, analysts have often been concerned with national differences in doctrine, tactics, techniques, and procedures (DTTP), technology, and the command decision processes (CDPs) that might be encountered during conflicts. With the increased visibility of asymmetrical warfare, there is also considerable interest in the organizational structure of smaller groups and cells from relatively unstudied nations and cultures.

Military analysts have needed to expand their concern beyond historical adversaries to include new adversaries. They have to look beyond nation states to non-conventional adversaries including terrorist organizations. Globalization has also expanded the nature and extent of interactions with allies. There has been increased prevalence of coalition operations and humanitarian missions. While the model of the past was of independent national action, perhaps in alliance with others, national military organizations are now more likely to work in integrated units with counterparts from around the globe. The United Nations as well as regional organizations, such as the North Atlantic Treaty Organization, work together in many theaters. In Bosnia-

Herzegovina, for example, troops from over 30 nations staff NATO's Stabilization Forces Headquarters. Their leaders work together in teams to assess conditions, plan, coordinate actions, and manage emergencies.

The increasingly complex and dynamic tasks facing multinational corporate, scientific, and military organizations often require multinational collaboration. These are important for four reasons: 1) Complex tasks demand multiple players in order to complete the required work in a timely fashion. 2) Complex tasks can demand expertise in domains beyond the competence of one person or one nation. A corporate decision about marketing, for example, may need regional specialists, product designers, logistics coordinators, and MIS specialists. 3) Multinational commerce requires buy-in so that all partners see the big picture and work toward organizational goals. 4) Contributions from nationally diverse participants may contribute to adaptability and creativity, as multinational teams draw from a broader base of ideas and constructs. Multinational collaborations allow the leveraging of expertise, effort, commitment, and adaptability toward a set of common goals. Teams are one important tool for collaboration.

The growing role of multinational collaboration places pressure on practitioners to cultivate effective multinational teams and on researchers to understand and model multinational teams in order to enhance performance. The challenge is to make these collaborations successful despite a range of cultural differences. This chapter will describe some of the key cultural differences that can disrupt teamwork. By understanding these potential barriers, practitioners should be better able to overcome

the problems created by cultural differences. They will also be able to incorporate different forms of collaboration into organizational simulations, to reduce current heavily Western-centered concepts.

Researchers have studied collaboration for many years in their effort to improve the performance of organizations and work groups within organizations. These research efforts have generated descriptive models of organizational performance, and these models generate guidelines and principles of effective team interactions. However, this research and these models are all based on Western populations, primarily United States teams. Will these ideas about effective teamwork generalize to other national groups and cultures? Our claim is that they will not generalize and that attempts to apply Western concepts of effective teamwork to other cultures can result in confusions and misunderstandings. We believe that existing Western-centric models need to be supplemented with alternative concepts of collaboration.

TEAMWORK: CURRENT MODELS AND LIMITATIONS

Current Models

A review of current concepts of teamwork provides a starting point for understanding the challenge of global collaboration. The interest is in the teamwork found in organizations working in natural settings. By this, we mean complex and dynamic settings that may include ill-defined and changing goals, incomplete information, time

pressure, and uncertainty. There has been a great deal of research devoted to collaboration, teamwork, and organizational functioning (e.g., Swezey, Llaneras, & Salas, 1992; Zsambok, Klein, Kyne, & Klinger, 1993). Substantial progress has been made in outlining the requirements of teamwork and collaboration. It is beyond the scope of this chapter to review the vast literature on teamwork. Instead, we will rely on a synthesis of this literature that was developed to crystallize all that has been learned into a core set of competencies that are needed for effective teamwork.

Sims, Salas, and Burke (2003) provided a “Big Five” model of the competencies required of successful teams. Starting from the accumulated research related to team functioning, they propose five core competencies that together integrate existing research in providing a model of teamwork. They also propose three mechanisms for coordination. The competencies are:

Mutual Performance Monitoring

Natural domains place complex and changing demands on team members. The complex and dynamic nature of the tasks can alter the workloads of members and introduce unexpected demands. This may make it difficult or impossible for an individual team member to complete needed assigned tasks. Mutual Performance Monitoring allows individual team members to identify the mistakes, slips, and lapses of others on the team, based on shared knowledge of the task and of individual

resources. Monitoring provides an early warning signal for problems and breakdowns during complex operations.

Back-Up Behavior

Monitoring is necessary but not sufficient for effective teamwork. When mistakes or lapses are identified, successful teams can ameliorate the problems. Back-up Behavior, depending on monitoring, allows a team member to take on tasks and responsibilities of others as needs and problems develop during work. It serves as a mechanism for balancing workload as demands vary over time. Teams function better when members fill in for each other.

Adaptability/Flexibility

At a strategic level, the team competencies of monitoring and back-up require Adaptability/Flexibility. Complex work environments often include elements of uncertainty and surprise. These demand ongoing changes in strategies and plans. An effective team must adapt as a unit to change. When surprises occur, adaptability allows for a smooth transition to a new course of action.

Team Orientation

Effective teams are more than a number of individuals doing an assigned task. They must also have a collective orientation. Team Orientation describes this collective tendency. It describes the extent to which team members identify with the accomplishments of the team and not simply with their own work performance. This Team Orientation results in stronger individual performance through coordination, evaluation, and group communication. Each team member functions as a part of an interdependent group. This conceptualizes an organization as a system functioning in a coordinated way for the common good. Coordination is critical for the accomplishment of the complex tasks demanded in natural domains. Team Orientation can be pictured as an interconnected system of individuals (see Figure 1).

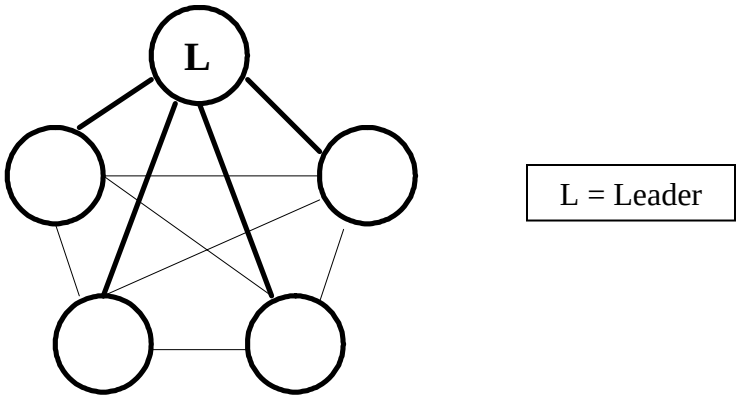

Figure 1. Team interaction model.

Team Leadership

Coordinating the complex tasks of a team requires leadership. Team Leadership creates a Team Orientation, maintains shared knowledge, fosters coordination and skill development, and structures team experience. The leader has
the responsibility for defining team goals, organizing team resources, and providing guidance for reaching goals. A leader also sets expectations and fosters a climate that leads to successful interaction patterns. While the leadership role can vary, the competencies are critical. The role of leader is critical no matter how the leader has been selected. Leadership is represented in Figure 1 as an increased flow of information and directives as the leader coordinates actions and intents.

While task demands can alter the relative importance of these five competencies over the life cycle of a team, Sims et al. (2003) maintain that each competence is important for effective organizations. These five competencies require coordination and three mechanisms for coordination are proposed. Sims and colleagues see these mechanisms as providing a supporting structure for coordination. These mechanisms are:

Shared Mental Model

A Shared Mental Model provides each team member with a common understanding of the long-term goals, the nature of the required tasks, the roles, skills, and capacities of

team members, and the interrelationship among tasks and people. A Shared Mental Model allows the anticipation and prediction of needs and problems. A Shared Mental Model supports performance monitoring by providing expectations for teams tasks. It allows adaptation/flexibility by providing functional understanding of activities and needs.

Closed-Loop Communication

Communication provides ongoing sharing of information about individual functioning and overall status. It gains in importance as complexity increases by allowing the ongoing distribution of new information. Closed-Loop Communication involves the initial sending of a message, the receiving, understanding, and acknowledging of the message, and follow-up to confirm the accurate transmission of information. Closed-Loop Communication insures the exercise of Team Leadership and a Team Orientation.

Mutual Trust

Finally, Mutual Trust allows a sustained commitment to common goals and processes. It provides confidence that others will perform as expected and it conveys that each participant will protect the interests of the others as part of a commitment to their shared goals. Mutual Trust is critical for a Team Orientation. Before team members take on additional duties, they need a sense of common cause and reciprocity.

These and most other models of effective teamwork converge on a set of “best practices,” and are overwhelmingly based on research designed by Western scientists with Western samples using Western paradigms.

Describing Applied Domains with Current Models

We will now review several domains that illustrate how national differences call for an expanded version of the ways that organizations work together on complex tasks. These domains are multinational peacekeeping operations, civil aviation, and foreign CDPs. In each domain, we will look at the role of the five competencies in effective organizational functioning. This analysis is based on naturalistic observation, interviews, and research conducted within multinational and non-Western organizations. It suggests that the key five competencies described above as needed for effective team functioning and decision making may be ethnocentric and specific to Western cultures. The “ideal competencies” do not always generalize to non-Westerner and multinational organizations. Non-Western groups often do not subscribe to these views, and sometimes even find them inefficient. We are not criticizing the work of Sims et al. (2003). We find this work valuable for capturing the essence of Western-based research. Our concern is simply that the factors identified by Sims et al., and by the researchers from whom they draw, cannot be safely generalized to non-Western teams.

Multinational Operations

Multinational peacekeeping is a growing concern for military training. This research was conducted under Prime contract DAAD19-01-C-0065 as part of the Technology Transfer for the Collaborative Technology Alliance program. As part of research sponsored by the Army Research Laboratory, we observed top-notch military units from different nations working toward common goals at NATO's Stabilization Force (SFOR) Headquarters in Bosnia-Herzegovina (Hahn, Harris, & Klein, 2003). As personnel from many different nations work together, they sometimes have interesting problems related to the competencies and mechanisms described above.

To learn more about these problems, we interviewed participants to identify and understand the dynamics of their cross-cultural problems. To learn about Back-up Behavior, we asked one non-U.S. soldier what he would do if a coworker was falling behind on his task at a time when he, the interviewee, did not have pressing tasks. We asked if he would fill in for the other, helping with the needed tasks. He shuttered and said, "Of course not. That would be 'eating another man's bread'." He explained that work and performing your assigned work was basic to a man's sense of self and accomplishment. "If you do another guy's job, you would shame him." *Challenge: Does this officer's scorn of Back-up Behavior mean that his nation cannot have effective teamwork? How do they balance workload when demands change?*

We found evidence for this same limitation of Back-Up Behavior in interviews with foreign national graduate students. Teamwork plays a critical role in many Western educational settings. Business and engineering programs often assign group projects to train students for what is viewed as a critical part of professional functioning. While U.S. teams view compensation and Back-up Behaviors as important in organizations, this is not universal.

At SFOR, we also explored the function of Team Orientation (Hahn, Harris, & Klein, 2003). For several of the national groups, optimal organization was seen as having the leader at the center and each member connected to others through the leader. Coordination and communication was accomplished only through the leader. A sense of interdependence was not seen as critical or even part of good group functioning. You work for your commander. There was no role for “self monitoring” or “Mutual Performance Monitoring.” These functions were neither needed nor understood. Instead, the teams appeared to rely on direct dyadic coordination of individual team members with the leader.

Several interviewees reflected on the inefficiency of the U.S., British, and Canadian forces. “They waste a lot of time and effort talking and checking each plan. Our commander knows what is going on and where we are headed. He is in the best position to make the decisions. The Brits are always “coordinating” because no one is leading.” “The more people involved in coordination, the more opportunities for

mistakes." The non-Westerns were skeptical of the way that Mutual Performance Monitoring and Back-up Behaviors increase coordination costs.

A different pattern of coordination can be described as a hierarchical pattern or, in the most basic case, a hub-and-spoke pattern (see Figure 2). As shown below, the flow of information, decision making, and coordination is from the team leader to each team member. The hub-and-spoke arrangement is different from the interactive team arrangement assumed by descriptions such as the "Big Five" model. *Challenge: How can communication and coordination be accomplished if the team members are not interacting with each other?*

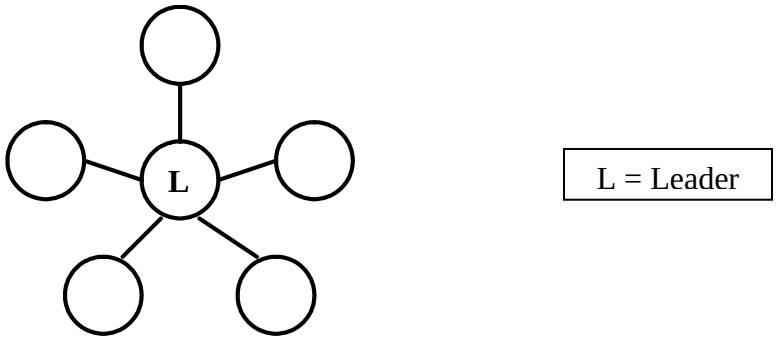

Figure 2. Hub-and-spoke model.

Finally, our observations revealed limitations with concepts of "adjusting" or Adaptability/Flexibility. "Operation Harvest" in Bosnia has as its goal the collection of guns, explosives, and other weapons. This is to reduce the probability and severity of dangerous clashes between civilians. American and British teams talk about the strength of "staying loose to always be ready for any surprise that comes along." But

this is only one approach to a successful operation. Other national groups stress the value of careful, well-defined planning. “The Brits just don’t do their work ahead. If you are surprised, you did not do your job. I make sure everything is set. I’m not risking my men’s lives.” This approach values precision over flexibility. The Westerners say, “They never get out into the field to do the work because they are too busy planning. Then if something really unexpected comes along, they are stumped.” Here we see flexibility, a Western preference, over precision. *Challenge: How should we handle differences between national groups in the way precision and flexibility are valued?*

Thus, each of these four competencies, as defined in Western terms, runs into trouble. What about Team Leadership? The Western concept of leadership is problematic in two ways. First, several personnel from the former Warsaw Pact nations expressed their dismay that the Western commanders often delegated responsibilities that they felt should not be delegated. “Our commanders do their jobs. They don’t ask us to do them.” They do not feel it was their role to work directly with others or to make decisions. That was a leader’s job. In contrast, personnel from one of the Northern European nations expressed that some leaders did not sufficiently share knowledge or include others in setting goals and organizing actions. We are highly trained professionals.” We work best when we can contribute to decisions. *Challenge: Can people with different leadership models function successfully together on teams?*

Civil Aviation

Next we examined the role of non-Western collaboration in civil aviation. Boeing Aviation sponsored this research. Boeing scientists know that while their equipment, procedures, and training are used worldwide, the safety outcomes vary by region. In an effort to learn more about potential national differences in explaining the differences, Klein, Klein, and Mumaw (2001) interviewed personnel in charge of training and assessing the skills of international pilots. The trainers were all Americans with decades of aviation experience. They used American designed/built planes, flight simulators, and manuals—important tools for training and testing.

Consistent with the model of teamwork presented above, Americans view Adaptability/Flexibility as an important part of training and testing. When American trainers test Americans and other Westerners, they routinely change the orders of simulated incidents and alter their characteristics. They value flexibility in handling routine flight challenges and also non-routine simulator challenges.

Our interviews examined the way Japanese pilots are routinely tested in simulator exercises. When Japanese trainers do this, they use a standard order with no variation. The pilots are required to manage the incidents to achieve rapid, flawless performance. The Japanese, who are exceptionally good on the practiced exercises, are very weak in managing unexpected variations. In contrast to U.S. pilots, those from some other regions were not only less skilled at handling the unexpected, but they also were

irritated by the exercises. They made it clear that they trained for precision not flexibility and that they valued precision more highly than flexibility. Their comments reflected the belief that expert pilots flew with precision, eliminating the need for disparate solutions and flexible approaches. *Challenge: How can effective training be provided to crews that strive for precision and those that strive for flexibility?*

Crew Resource Management (CRM), a tool for aviation safety, was developed consistent with an American concept of teams. While CRM has evolved over the years, its underlying intent has always been to use all of the strength available in the cockpit. This means that the pilot does not fly alone but with the aid of the 1st officer's second set of eyes and ears. Crews are trained to attend to this information and to respect it. Considerable effort was required to ensure that this approach was incorporated in Western nations.

It has proven even more difficult to incorporate CRM in some non-Western nations. Our belief is that the difficulty stems from national differences in team concepts including Monitoring, Back-Up, Adaptability, Team Orientation, and Leadership. CRM has not been easily adopted where it was incompatible with existing team concepts.

Crew Resource Management is based on Western concepts of teamwork, as described by Sims et al. (2003) five competencies. For non-Western countries, the CRM guidelines for Mutual Performance Monitoring, Back-up Behaviors, Adaptability/Flexibility, Team Orientation, and the nature of Leadership, are simply not

relevant. Three examples provide contrasts with typical American performance. Chinese captains receive flight instructions from the control tower. One flight inspector reported how captains would ignore obvious dangers when their judgment conflicted with the instructions they had received. He said he had been on a plane when it flew directly through a severe storm. The Chinese captain had been told to proceed and he did. It had not been his job to assess the weather on route.

The next example occurred during a check ride on a Middle Eastern aircraft. The check pilot told us how he had made several in-flight suggestions to the captain. This is a typical pattern for such flights. After the flight and as soon as the rest of the crew had left the cockpit, the captain told the check pilot that no one could ever criticize him in his aircraft.

A well-documented aviation disaster, VASP, Flight 168, in South America provides a last example of teamwork contrasts. On 8 June 1982, a Boeing 747 was flying near Sierra de Pacatuba, Brazil. The 1st officer asks, “Can you see there are some hills in front?” The captain responds, “What? There's what?” Then, “Some hills, isn't there?” This was followed by the sound of impact. Here, the 1st officer’s attempt to monitor the captain was “inappropriate and so ignored.” The aircraft crashed into a 2,500 ft. mountain during an approach in heavy rain and fog. Despite two altitude alert system warnings and the co-pilot's warning of the mountains ahead, the captain continued to descend below the minimum descent altitude. *Challenge: How can a cockpit crew use*

all of the resources available in a way that is compatible with non-Western as well as Western nations?

Foreign Command Force Modeling

Military plans try to transform the past actions and decisions of the adversary into predictions and action plans for the future. This foreign CDP comes from a different framework but presents a convergent picture with those of the other domains. During the Cold War, United States forces learned a great deal about the Soviet military organization as well as the organizations of U.S. allies. Extended and varied experiences also provided an understanding of the capacities and characteristics of equipment and technology. This knowledge of organizational structure was captured in conceptual models describing the CDP of ground forces. Models described the deliberate planning process—for the offense and defense —for a division commander and staff (Tamucci, Timian, & Burnett, 2000).

During Desert Storm, in 1991, analysts would have benefited from CDP-based models describing Iraqi military actions. Such models would have provided a picture of information flow, command processes, and coordination as well as the nature of plans, risk management, and typical logic. The U.S. and its allies knew that the Iraqis used Soviet equipment and some aspects of Soviet force structure and DTTP and that they also used aspects of British-based force structure and DTTP. Military analysts attempted to use this information to predict Iraqi patterns. Models of CDP of the

deliberate planning process, however, failed to describe the performance of the Iraqi Army. Doctrine-driven models alone could not account for the behavior of a commander and his staff.

Organizational simulations required more than force structure, DTTP, and equipment specifications in order to make good predictions. One missing piece was national differences. Lannon, Klein, and Timian (2001b) described a need to incorporate national differences into any organizational simulation that is intended for use with non-Western cultures. The Iraqi military decision process, for example, does not share British Team Orientation or Team Leadership. While the British structure was officially hierarchical (see Figure 3), many channels were available for informal communication. The Team Interaction Model (Figure 1) helps to understand British leadership and team orientation. This interactive element would be lost if the model were to be adopted by hierarchical nations. The absence of informal channels makes monitoring and back-up more difficult.

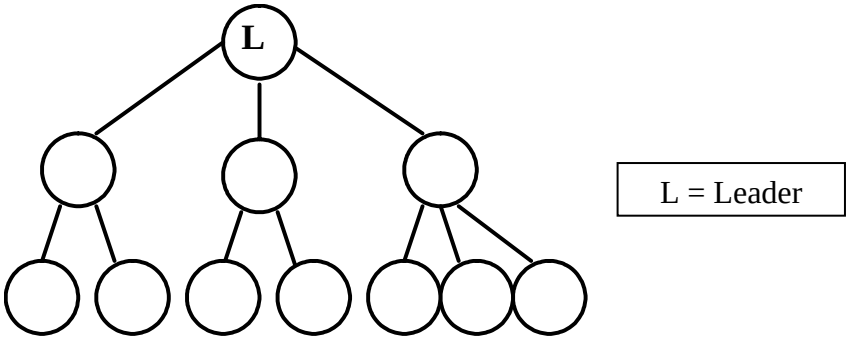

Figure 3. Hierarchical model.

Traditionally, military intelligence is focused on doctrine as the primary indicator of how an army will fight. However, doctrine alone cannot account for military behavior. Armies are products of their country's history and culture. The reason that Iraqi forces did not fight exactly like the Soviets is due in part to the fact that the Iraqi and Soviet armies have some differing military structures, but an even more important reason is because the Russian and Iraqi cultures are very different. Even in those cases where Iraq has adopted a Soviet procedure in its entirety, the Iraqi commanders saw that process through an "Iraqi lens" and did not implement that process in a fully "Russian manner" (Lannon, Klein, & Timian, 2001a). Simulation developers cannot simply model formal procedures; they also need to incorporate national differences in the assignment of roles and functions. *Challenge: How can simulations incorporate national differences in teamwork?*

Summary

Researchers have assumed that collaboration is the same across nations because they assume that cognition and the social context of cognition are common across national groups. Yet, differences abound. We see them during multinational peacekeeping missions, and they are a critical contribution to civil aviation crew behaviors. They are a pervasive element in military organizations regardless of formal doctrine. Taken together, evidence from studying the domains of peacekeeping, civil aviation, and command force modeling suggests that current models of organizations and their needed competencies are not universal. Efforts to understand, predict, and simulate

organizational action fail when the impact of national differences is not considered. While current models may describe U.S. and probably some Western teams, they do not provide a good picture of collaboration in other regions of the world. This is not surprising because past research is based almost exclusively on research conducted by Western researchers, with Western paradigms and Western participants. Globalization complicates the task of developing organizational simulations.

In multinational operations, it is necessary to understand and anticipate the teamwork of others. In aviation, it is necessary to design and train for the teamwork of users. In foreign command force modeling, it is necessary to incorporate the teamwork differences of adversaries. We need to anticipate the actions of both our allies and our adversaries from many different nations. Finally, organizational simulations must represent national differences in order to make accurate predictions. To do this we need more than the five competencies proposed as necessary for effective teamwork by Sims et al. (2003).

NATIONAL DIFFERENCES AND THE MECHANISMS OF TEAMS

The five competencies are a necessary consideration in understanding organizations and collaboration. We now focus on how the additional challenge introduced by national differences affects the coordination mechanisms of Shared Mental Models, Closed-Loop Communication, and Mutual Trust. We will review national differences in cognition and the social bases of cognition (Klein, H. A. 2004) found in the recent cross-cultural

psychology, cultural anthropology, and cognitive psychology literature. We will show how these national differences challenge the universality of the coordination mechanisms. If models of Western teams cannot be safely generalized to other national groups, then we need to understand why our Western models are breaking down. By incorporating knowledge of national differences we can provide a more accurate and useful model for understanding the mechanisms for coordination used by multinational teams.

We have already made the case that team competencies vary for different national groups. They also vary in expectations, procedures, reactions to uncertainty, and roles. As a result, members of different groups may be continually surprised and disoriented when faced with the practices of other groups. This reduces predictability, which is a prime requirement for effective coordination. Differing Mental Models make it difficult for members of one national group to anticipate and understand the decisions and actions of other groups. Differences also prevent members of multinational teams from using abbreviated messages and other efficiencies that can cut coordination costs.

Several research traditions describe national differences in cognition and the social context of cognition. We will first describe four of these research traditions and then present specific dimensions that create barriers to effective collaboration in multinational groups. The dimensions influence the creation of Mental Models for cognitive work, judgment, and decision making. They generate different approaches to communication and can interfere with the unimpeded flow of information. To the extent that these

dimensions influence people in organizations, they can undermine Mutual Trust within multinational organizations.

- Kluckhohn and Strodtbeck (1961), working in the tradition of cultural anthropology, identified differences among pre-industrial groups. They documented variations in planning, with some groups looking at the weeks ahead while others looked to the long-term needs of their grandchildren. The term “Time Orientation” describes this difference. They also noted that some groups accommodated events in the world while others appeared driven to master them. “Relationship to Nature” describes this difference. Finally, some groups valued work and achievement while others valued people and relationships. They used the terms “Doing” and “Being” to capture this difference.

- Hofstede (1980), a social psychologist, used methods of social psychology and industrial/organizational psychology to identify differences among employees of a large multinational corporation. The research built on earlier research including that of Kluckhohn and Strodtbeck (1961). Members of different national groups varied in their comfort with uncertainty. Some were comfortable with uncertainty while others worked to reduce it. “Uncertainty Avoidance” describes this difference. Some groups respected and conformed to hierarchical structure while others showed an egalitarian structure. “Power Distance” describes this difference. Recent work confirms the importance of these differences in aviation

and medicine (Helmreich & Merritt, 1998). Hofstede (1980) also presented Individual-Collective and Masculinity-Femininity as dimensions of difference.

- Markus and Kitayama (1991) looked at reasoning across national groups from the framework of cognitive psychology. Consistent with earlier notions of individual-collective, they proposed that this social dimension shapes the concept of self. The individual social characteristic is associated with an independent self-concept while the collective person has an interdependent self-concept. These concepts are reflected in cognition. While most people are capable of a range of reasoning, some groups—those that are interdependent—prefer reasoning grounded in concrete reality. Groups that tend to be independent tend to favor more speculative, hypothesis-based reasoning. The distinction is described as "Concrete vs. Hypothetical Reasoning."

- Nisbett and his colleagues (Nisbett, Peng, Choi, & Norenzayan, 2001; Norenzayan, Smith, Kim, & Nisbett, 2002), explored the differences between analytic reasoning—characteristic of people from Western nations—and holistic reasoning—characteristic of east Asian nations. They noted that analytic groups attributed cause to individual dispositional characteristics while holistic groups were more likely to look to situational as well as dispositional contributions (Choi & Nisbett, 1998; Choi, Nisbett, & Norenzayan, 1999; Morris & Peng, 1994). "Attribution" describes this distinction. They also noted that people from analytic nations tend to make decisions by contrasting: seeking distinctions and choosing

between options. Those from holistic nations tend to synthesize: seeking commonality. “Differentiation vs. Dialectical Reasoning” describes this difference (Peng & Nisbett, 1999).

- H. A. Klein (2004) formulated a Cultural Lens Model (CLM) to capture the distinctions that appear to be valuable for understanding differences in cognition the social context of cognition. We will now look more carefully at six dimensions from CLM that are particularly important for the team coordination mechanisms of Mental Models, Communication, and Mutual Trust. These dimensions include: Relationship-Achievement, Power Distance, Tolerance for Uncertainty, Hypothetical-Concrete Reasoning, Causal Attribution, and Contrasting – Synthesizing. Some of the dimensions are relabeled from the original model for clarity.

Relationship-Achievement

The first of the six dimensions, Relationship vs. Achievement, is parallel to the Being vs. Doing dimension of Kluckhohn and Strodtbeck (1961). This dimension describes the emphasis on social interaction patterns within organizations and has less influence on the underlying logic or reasoning of decisions. It influences the flow of information and the establishment of trust. Those with an Achievement orientation, typical of Westerners, separate their work from their social interactions. They come to work to accomplish goals and view socializing as a waste of time. If it takes being at their desk

until late at night, they view it as their job to be at their desk. They define themselves and others by assigned roles. In contrast, those with a Relationship orientation view the social relations formed at work as an integral part of their job. They value the linkages and the social opportunities these create. They view personal relationships and the concurrent Mutual Trust as vital for the long-term success in goals. They know the key people when connections will help. Each of these positions—Relationship and Achievement—carries a different view of teamwork.

At HQ SFOR in Bosnia-Herzegovina, differences on this dimension were reflected in pervasive differences in team functioning. Americans come to work early. They did their job working through lunch if needed. They treated others “professionally” being careful not to waste time in irrelevant chatter. Other groups were more likely to view the work environment as an extension of their social life. They took the time to network and get to know others. They developed working relationships. What may have looked like slacking translated into a strong interpersonal connectedness and a tool for managing task demands. These differences impacted Closed-Loop Communication moderating the flow of information. They influenced the resources each person could tap, the speed with which tasks were accomplished, but also the level of commitment given to tasks. They influenced the time needed to reach productivity.

Both Relationship and Achievement styles can work, but the mechanisms and patterns are different. Each generates a different Mental Model of how team members interact and how tasks should be accomplished. Communication differs because each style

suggests different patterns of sharing information. Such differences have a profound impact on Mutual Trust. Nations with similar patterns are mutually respectful and they may look down at others. At SFOR, U.S. staff complained, “A two hour lunch! They waste their time socializing while we work.” Italian officers told us, “You can’t spend your time at your desk and expect to work on a team. The Americans never figure out how to cooperate with the rest of us.” *Challenge*: *How can people work together effectively when they have different expectations for time use and the role of socialization? How can Mutual Trust develop in such an environment?*

Power Distance

Power Distance comes from Hofstede’s (1980) work and has been heavily used in business, aviation, and medicine. It has been represented in earlier organizational simulations. This dimension describes the social nature of leadership and the flow of information within an organization. It has less influence on the underlying logic or reasoning of decisions but rather focuses on the social and behavioral constraints that surround organizational processes. It influences the flow of information and the establishment of trust. High Power Distance is consistent with a hierarchical organizational structure. Leaders expect to make decisions and give orders. Other team members want direction from their leader and do not want or have the skills to initiate actions. The assignment of roles and functions is based on place in the power hierarchy. In low Power Distance groups, people at all levels see themselves as sharing in decisions and information.

We hear a great deal about a “military culture,” or an “aviation culture,” to describe how military officers and pilots and other groups have their own standards and worldviews, regardless of their national origin. Certainly, training in military mission or aviation provides some commonality that transcends national boundaries. However, in observing interactions between military officers and pilots and other groups who claim a distinct professional culture, we are struck by the predictable conflicts and confusions that reflect national origin. Even in military and aviation domains, a necessarily high Power Distance organization, national groups differ greatly in the distribution of power and the flow of information.

The impact of Power Distance differences across national groups can be seen in attempts to export CRM to the cockpits of airlines around the world. Western procedures depend on the free two-way flow of information. Even though the captain has final say, it is expected that the 1st officer tell the captain if there is a problem or if he makes a mistake. Crew Resources Management assumes that information flows freely. The Mental Model demanded for successful CRM is a Western Mental Model of teamwork. The communication patterns demanded are Western communication patterns. When Western procedures are transplanted to high Power Distance nations, they can fail because 1st officers do not provide a useful second set of eyes and ears to detect problems. They do not see it as their role to disagree or contradict the captain. While CRM has proved to be valuable in ritualizing back-up monitoring in Western nations, it has not been as successful in other regions. The next step in exporting CRM

to non-Western organizations would be to develop techniques that are compatible with Mental Models and communication patterns stemming from the high Power Distance of non-Western flight crews.

Power Distance is strongly related to leadership. Power can be assigned by competence and training or it can be assigned by family status, kinship affiliation, or group membership. The role may be symbolic with goals, organization, expectations, and interactions carefully defined by a hierarchy or by past practices. Alternately, the role of the leader may be flexible and emerging. When team interactions are minimal, this alters the function of the leader. In interviews, we found that the formality used in selecting a leader varies across Western and Far Eastern cultures. Chinese businessmen described a relatively formal—and less emergent—process for selection. For more important projects, some organizations may use a panel of experts to appoint a leader.

Leaders in some places are clearly identified and “in charge.” The leader may sit in a specific place with those of equal or close importance sitting next to him. The farther away you sit, the lesser your importance. One informant reported, “The leader is the only person who speaks in the meeting. The others may converse with him individually. In other groups, the leader may provide input to insiders, but not speak directly to other people at the meeting.

The level of authority that team leaders generally possess may also vary. Chinese MBA students with years of experience working in both private and government-owned companies provided some insight into this. In general, although the leader of a Chinese team is expected to listen to every team member's opinion, it is his responsibility to make the final decision. Once the decision is made in a Chinese business organization, it is highly inappropriate for team members to question it or criticize it. As a team member, you must accept it and support the leader's decision, even if you do not agree with it and even if it leads to a sub-optimal outcome. Adaptation is not an alternative after this point. *Challenge: Can communication be effectively maintained when members have different Mental Models of authority and Power Distance?*

Tolerance for Uncertainty

Tolerance for Uncertainty comes from Hofstede's (1980) Uncertainty Avoidance dimension. The CLM changed the term because the original term was difficult to explain to practitioners. Tolerance for Uncertainty is part of the social context of cognition as well as part of cognition itself. While it moderates the interpersonal interactions within organizations, it is also influential in risk assessment and decision making. This dimension often appears in business and military settings. It was represented in earlier organizational simulations. Tolerance for Uncertainty describes the level of risk, uncertainty, and ambiguity acceptable by members of a group. In low Tolerance for Uncertainty nations, uncertainty is aversive and people work hard to reduce it. In order to accomplish this goal, they emphasize detailed time lines and procedures. Fixed and

committed plans are viewed as important while changes are stressful and to be avoided. Care is taken to insure the accuracy of incoming information. In contrast, high Tolerance for Uncertainty nations prefer flexible planning. They are willing to begin with incomplete information and will change readily when new information becomes available.

Differences in Tolerance for Uncertainty were troublesome during multinational operations at SFOR. Operation Harvest is a disarmament effort in Bosnia-Herzegovina in which weapons are collected in order to lower the risk of aggression. Some national groups would act only when they had complete information, even if it meant fewer collections. They meticulously scripted each home visit and specified many variations of each script. When there was more rain than anticipated, they would cancel a planned collection. They had not worked out the details for the rainier, hence muddier situation. Officers from other nations were appalled by this caution. They wanted a general plan and the flexibility to respond to deviations along the way. Thus, we see two very different Mental Models of appropriate planning.

Differences in Tolerance for Uncertainty decrease Mutual Trust among coalition members. An officer from the low Tolerance for Uncertainty group, uneasy with the “careless” planning of high Tolerance for Uncertainty staff reported, “When we sit down to plan, they drive us nuts! They want to keep everything open. We have to make decisions and we should do it when we have the time to think!” The high Tolerance for

Uncertainty officers said, “They are so busy planning, they never get out to collect weapons. Sometimes, you just have to punt! Our men can always figure out what to do.”

Business organizations also reflect the Tolerance for Uncertainty characteristic of their nation. Japanese businesses are known for their careful, detailed planning. They devote considerable effort to consider all options and to include all organizational levels. Once the plan has been adopted, it will be carefully followed. They also prefer long-term contracts and commitments to support their planning process. At the same time, Japanese business practice reflects an anxiety with ambiguity. No “shooting from the hip” here! *Challenge: How can team functioning be understood across differences in Tolerance for Uncertainty?*

Hypothetical—Concrete Reasoning

Markus and Kitayama (1991) started with a social concept of self to understand Hypothetical-Concrete Reasoning. This dimension, and the two that follow, describe differences that underlie complex cognitive performance. They are more difficult to represent in simulations, but have the potential for improving predictions of complex operations including problem identification, planning, and decision making. They are critical for identifying the difficulties that emerge with Mental Models as well as the difficulties that can undermine Mutual Trust. Groups that have an interdependent concept of self ground their reasoning in concrete reality. In contrast, more speculative, hypothesis-based reasoning is associated with an independent self-concept. Parental

and educational practices as well as modeling of adult patterns help to develop the reasoning characteristic of a particular national group.

Each of these cognitive patterns leads to a different Mental Model for approaching new situations and challenges. Concrete Reasoning looks to past examples and events as the first guide to understanding and planning. Assessment of situations and planning are both grounded in experience and history. Information needs are high because concrete reasoning strives for precise predictions based on appropriate comparison cases. In contrast, Hypothetical Reasoning requires speculation on the forces at work in a new situation. Engaging in mental simulation of possible actions is part of planning. Those with Hypothetical Reasoning are comfortable thinking about situations they have never experienced. This leads to flexibility in the face of surprises sometimes at the cost of precision.

Differences in reasoning lead to differences in planning and decision making and different information needs and options. A source of mistrust in multinational planning teams at SFOR was the difference in planning generated by differences in Hypothetical-Concrete Reasoning. It is hard for a person who uses Concrete Reasoning to see why others speculate before they have all the needed data. They do not see why plans with potentially serious consequences can be based on “imagination.” It is hard for those with Hypothetical Reasoning to see why others refuse to show any creativity in their analysis. They think others should be able to “think outside of the box.” Particularly under time pressure, the person with Concrete Reasoning can be seen as an

impediment to action. *Challenge: How must the nature of planning change if it is going to be executed by members of cultures who have a different Mental Model of reasoning?*

Causal Attribution

Faced with complex information, pressure, or opportunity, people use different Mental Models to attribute causality to their observations. Nisbett and his colleagues (e.g., Ji, Peng, & Nisbett, 2000; Nisbett, 2003; Nisbett, et al., 2001) noted powerful differences among national groups in this attribution (Choi, Dalal, Kim-Prieto, & Park, 2003; Choi, et al., 1999; Morris & Peng, 1994). Attribution focuses attention and narrows the selection criteria for approaches or remedies. Those with dispositional attribution attend to the unique characteristics of the person or object locating responsibility primarily in the individual (Choi, et al., 1999). In contrast, those with a situational attribution model were more likely to adopt context-dependent and occasion-bound thinking and look to situational and contextual contributions. A dispositional Mental Model of causality is more characteristic of Western nations, and a situational model is more characteristic of East Asian nations.

Attribution provides the initial situational assessment and directs problem identification and problem solving. When organizations or teams encounter anomalies or problems, they must make sense of it before they can make decisions or plan change. In Bosnia, the peacekeepers differed in their attribution. When peacekeepers in Bosnia faced

difficulties maintaining services in a refugee camp, they differed in their attribution of cause. Similarly, repetitive aviation equipment failures and unexpected enemy activity brought forth different causal attribution from maintenance personnel and military analysts respectively. Sensemaking among collaborative partners is based on existing Mental Models of causality.

A dispositional attribution demands a plan that addresses the individual characteristic identified as the cause. Training, selection, disciplinary actions, and counseling might be considered appropriate remedy for organizational concerns attributed to individual dispositions. A situational attribution calls forth solutions that may encompass multiple contextual considerations. Those with situational attribution look to the broader context and holistic solutions. They are less uncomfortable with retraining that targets specific individuals. They favor efforts to modify organizations and procedures while placing less weight on selection standards. It is only possible to predict the actions of an adversary or a team member, by using the same Mental Model as the adversary or team member.

There is merit in both approaches to attribution. Multinational organizations, however, have trouble arriving at a solution when they do not share a Mental Model of attribution. As in earlier analysis, a difference in this dimension can reduce Mutual Trust because each party may be critical of the sensemaking and planning of the other. *Challenge: How can people begin to solve problems when they cannot agree on what the problem to be solved is?*

Contrasting – Synthesizing

Contrasting – Synthesizing, taken from Nisbett's concept of Differentiation vs. Dialectical reasoning, describes the difference in how people typically manage inconsistent information and incompatible goals (Peng & Nisbett, 1999). We adopted this new label because it was better understood with users. Contrasters make decisions by seeking distinctions and choosing between options. They understand contradictions by separating and evaluating distinct qualities. This polarization sharpens distinctions by highlighting strengths and weaknesses in order to identify the best option. Synthesizers seek commonality and look for integration rather than sharpening distinctions. They avoid conflict (Chu, Spires, & Sueyoshi, 1999) and believe that all perspectives contain truth. Synthesizers seek harmonious intermediate positions, deny dichotomous descriptions, and retain elements of different perspectives (Peng & Nisbett, 1999; 2000).

Contrasters plan by developing and evaluating the relative merits of two or more plausible alternatives. They may even assign different teams to provide the best case for each alternative. Plans are reviewed with discussion focusing on relative advantages. The best option is selected for implementation although it may be modified to accommodate weaknesses exposed in the decision process. A good leader guides the group to the selection of the best alternative. Among Contrasters, conflict is considered healthy and is even sought out. It is viewed as a way to sharpen ideas and to improve performance.

Synthesizers consider a range of ideas, concerns, and options. The process is directed at integrating as many positive features and contributions as possible. They also try to avoid losing any of the strength. Each person looks for ways to pull ideas and conflicts together and cover up disagreement. A skilled leader would be one who can knit together the seemingly contradictory elements into a functional whole. In synthesizing groups, conflict is viewed as a damaging force and is avoided. People are careful not to offend other team members. If conflict begins to emerge, team members might cover up a disagreement.

This dimension can be seen in many contexts. Aviation maintenance personnel are expected to keep equipment on schedule and, at the same time, ensure the safety of every aircraft. Similarly, a pilot strives to arrive on time, but unexpected weather may make this goal risky. How are the competing goals managed? A manager may want to hire a top-notch scientist and also a dependable, cooperative coworker. How are hiring decisions made when the two characteristics do not appear in the same person?

Contrasters often describe synthesizers as indecisive. “They can never make up their minds! They will do every thing in order to avoid making a decision. Their plans are hodgepodges.” Synthesizers describe Contrasters as narrow and limited. “They are so eager to find one solution, that they discard a lot of good ideas in the process. It’s a weaker plan but they are happy because they value coherence over effectiveness.” This lack of a Shared Mental Model reduces Mutual Trust. *Challenge: How can multinational*

organizations engage in planning when they resolve contradictions and differences in ways that seem incompatible?

THE PROMISE OF ORGANIZATIONAL SIMULATION

Simulations are important tools for capturing the dynamic functioning of complex systems. Organizational simulations begin with a conceptual model of human organizations and with data on the actual functioning of the types of organizations under study. The simulation may be a complex and large-scale organization or it may abstract a more limited function of an organization. Simulations can use existing data to describe the generation capacity of a power plant or the ground speed of an army in varied terrains. In all cases, a simulation should have the capacity to generate testable predictions with clear analogues in natural organizations. The measurable outcome might be of time to task completion, flow of information, choices, and the like. The closer that prediction is to reality, the greater the confidence in future predictions. Naturally occurring changes or externally induced changes can provide continuing assessment and allow ongoing simulation revision based on observations in context.

As accuracy of predictions increases, we are more comfortable using the simulation outcomes to guide actions. How long will it take for a terrorist cell to recover after the elimination of its leader? What is the optimal staffing size for a surgical team? What external changes might impede a rogue state from rapidly implementing a deadly technology? These questions may carry life-and-death consequences. Comparisons

between simulation predictions and actual outcomes expose limitations. Deviations from predictions should be welcomed guides to upgrading simulations. When a simulation makes good predictions about optimal staffing for a small surgical team, but poor ones for a massive procedure such as open-heart surgery, this suggests revisions and extensions that strengthen the simulation.

We make the case that simulations need to incorporate national differences because of their pervasive influence on organizations. They need to incorporate how individuals assume roles and functions in organizations and how they carry out necessary roles and functions. They also must incorporate how information is selected from all valuable information and how it is used in decision making. National differences also influence the product of the collaboration itself—the nature of plans and how they are generated, modified, and executed. Cultural differences influence problem identification, planning, leadership, and coordination. Ignoring national differences leads to errors in understanding allies and adversaries. It can create dissonance and malfunctioning during coalition operations, international business, and other collaborative efforts.

We have well developed data-based models of teamwork. Why are we proposing something new for multinational teams? While current models may describe American and probably some Western teams, they do not describe collaboration in other regions of the world. We have made the case that non-Western and multinational collaboration can be qualitatively different from the collaboration of Western teams. This is not as surprising as it may at first seem that teamwork models are ethnocentric rather than

universal. Current models of teams are based on data almost exclusively from studies in Western nations. They do not incorporate the differences that distinguish national groups. We have detailed the limitations of teamwork models based almost exclusively on Western research. By tapping the research on national differences, we provide a more accurate and useful model for multinational organizations.

We must not assume that teamwork patterns in other nations mirror teamwork in the U.S. We need to identify how other teams define roles and functions, make decisions, manage conflict, and share information. Given the cognitive differences that have been described, and given the contrast between different team structures (interactive, hub-and-spoke, or hierarchical), we believe that organizational simulations can provide more inclusive and universal models of collaboration. Such models can better inform the design of collaborative information technology to support multinational collaboration. They can also better characterize individual action, craft training interventions, and enhance the productivity and success of multinational teams. If organizations do not take national differences into account, they run the risk of inefficiencies, miscommunications, and coordination breakdowns. We argue that by taking cultural differences in cognition and the social context of cognition seriously, more useful organizational simulations can be designed.

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